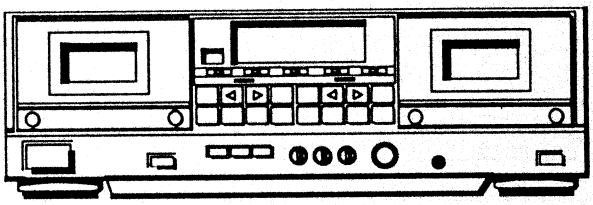
S/M Code No.89-062 DATE OF ISSUE 8/1989-I

AIWA®

AD-WX999

SERVICE MANUAL



STEREO CASSETTE DECK

• BASIC TAPE MECHANISM : α-14 • TYPE. H,U,E,K,Z

SPECIFICATIONS

Type	Stereo cassette tape deck
Track format	4 tracks, 2 channels
Power supply	AD-WX999E, Z AC 220 V, 50/60 Hz AD-WX999K AC 240V, 50/60 Hz AD-WX999U AC 120 V, 60 Hz AD-WX999H AC 120 V/220 V/240 V switchable, 50/60 Hz
Power consumption	33 W
Frequency response	METAL tape: 20–18,000 Hz CrO_2 tape: 20–17,000 Hz NORMAL tape: 20–16,000 Hz
Signal-to-noise ratio	73 dB (METAL tape DOLBY C NR ON)
Wow and flutter	Deck 1 0.15% (according to DIN 45500) 0.055% (WRMS) Deck 2 0.15% (according to DIN 45500) 0.055% (WRMS)
Tape speed	4.8 cm/sec. ($1\frac{7}{8}$ ips), 9.5 cm/sec (double speed)
Recording system	AC bias (frequency 105 kHz)
Erase system	AC erase
Motor	DC servomotor × 2
Heads	Record/playback head × 2 (PC-OCC coil pure amorphous head) Erase head × 2 (Double-gap ferite head)
Inputs	LINE IN maximum input sensitivity: 50 mV (over 50 kΩ)
Outputs	LINE OUT standard output level: 400 mV (0 VU); suitable load impedance: over 50 kΩ
Dimensions	430(W) × 140(H) × 313(D) mm
Weight	5.4 kg

- Design and specifications are subject to change without notice.
- Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.
- "Dolby", the double-D symbol, and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

AIWA Co., Ltd.

Tokyo Japan

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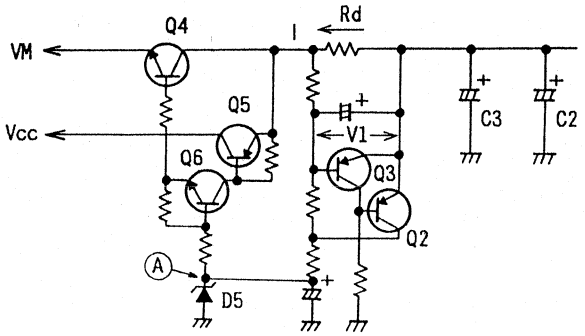
Cautions when servicing

The power circuit in this unit incorporates an overcurrent protector (shut-down circuit). When the overcurrent protector operates, voltages, VM, Vcc and Vref are not supplied. Once the overcurrent protector has operated, the power circuit will not be recovered automatically when is turned on, even after the cause of overcurrent is removed. Perform the following procedure to recover the power circuit.

1. Turn the power switch off.
2. Discharge C2 and C3 through a resistor of 100Ω or more. (It takes about 5 seconds to discharge C2 and C3 through a 100Ω resistor.)

Note : It takes about 90 seconds to discharge if step 2 is not performed.

Operation of Overcurrent Protector



During normal operation (Q3: OFF, Q2: ON)

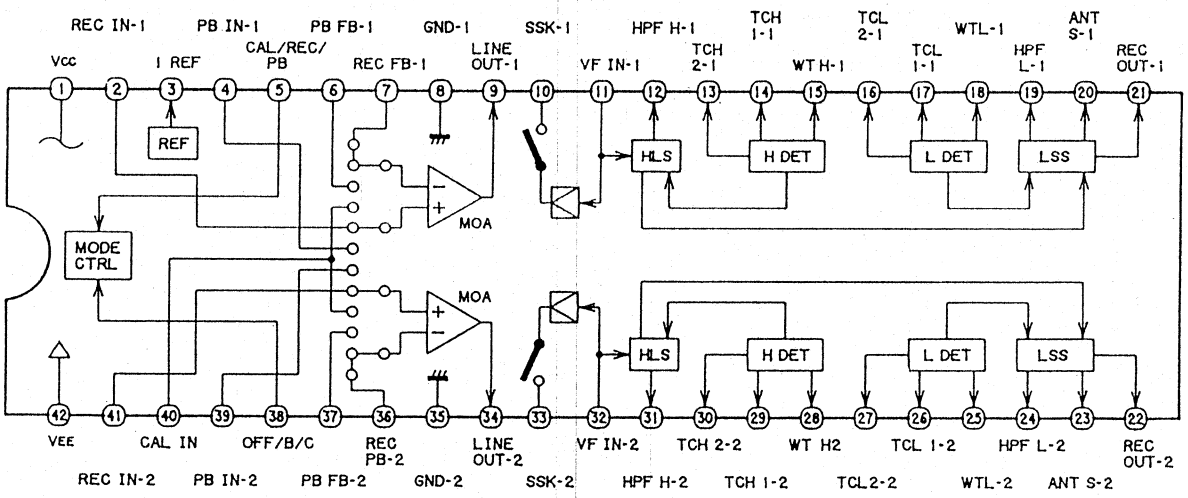
Since current I flowing to Rd is not large, V1 becomes lower than 0.6V and Q3 turns off. This causes Q2 to turn on, and the voltage at point Ⓐ becomes about 12V, so VM and Vcc are output.

When overcurrent occurs (Q3: ON, Q2: OFF)

When current I rises due to trouble on the VM and Vcc lines, V1 becomes higher than 0.6V and Q3 turns on. This causes Q2 to turn off, and the voltage at point Ⓐ drops abnormally, so VM or Vcc is not output.

IC BLOCK DIAGRAM

IC, CX20187



ELECTRICAL MAIN PARTS LIST

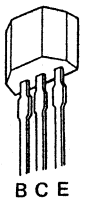
REF.NO.	PART NO.	DESCRIPTION
=== IC ===		
	87-001-441-019	IC,BA10358N
	87-001-440-019	IC,BA15218N
	87-001-143-019	IC,CX20187
	87-001-334-010	IC,LB9051A
	84-790-619-010	IC,LC6538D-4098
	87-020-533-019	IC,M4069UBP
	87-020-680-019	IC,NJM2068S
	87-020-758-019	IC,NJM2068SD
	87-020-908-019	IC,NJM4066BD
	87-001-533-010	REMOTE UNIT GP1U501X
=== TRANSISTOR ===		
	89-503-735-019	FET,2SK373GR
	87-026-463-019	TRANSISTOR,2SA933SR
	89-109-521-019	TRANSISTOR,2SA952K
	89-110-155-019	TRANSISTOR,2SA1015GR
	89-112-965-019	TRANSISTOR,2SA1296GR
	89-210-154-019	TRANSISTOR,2SB1015Y
	87-026-462-019	TRANSISTOR,2SC1740S,SR
	89-318-155-019	TRANSISTOR,2SC1815GR
	89-318-156-019	TRANSISTOR,2SC1815BL
	89-320-011-019	TRANSISTOR,2SC2001K
	89-331-130-019	TRANSISTOR,2SC3113
	89-413-023-019	TRANSISTOR,2SD1302S
	89-414-065-019	TRANSISTOR,2SD1406GR
	87-026-200-019	TRANSISTOR,DTC114ES
	87-026-379-010	TRANSISTOR,RN2206
=== DIODE ===		
	87-001-783-019	DIODE,1N4002
	87-020-691-019	DIODE,1SS132
	87-020-123-019	DIODE,DS446
	87-001-820-010	DIODE,GP15B(F)
	87-027-676-019	DIODE,ZENER HZ12B3L
	87-027-391-019	DIODE,ZENER HZ36-2
	87-027-301-019	DIODE,ZENER HZ3A1
	87-027-286-019	DIODE,ZENER HZ5C1
	87-027-649-019	DIODE,ZENER HZ7A2
	87-027-321-019	DIODE,ZENER HZ9B2
	87-027-584-019	DIODE,ZENER HZ9C1L
=== MAIN CIRCUIT BOARD SECTION ===		
C1	★87-010-400-019	CAP,ELECT 0.47-50V SME
C2	★87-010-390-019	CAP,ELECT 3300-25V SME
C3	★87-010-390-019	CAP,ELECT 3300-25V SME
C4	★87-010-405-019	CAP,ELECT 10-50V SME
C5	★87-010-384-019	CAP,ELECT 100-25V
C6	★87-010-644-019	CAP,ELECT 470-16V MUSE
C7	★87-010-263-019	CAP,ELECT 100-10V
C8	★87-010-644-019	CAP,ELECT 470-16V MUSE
C9	★87-010-237-019	CAP,ELECT 1000-16V SME
C11	★87-015-406-019	CAP,ELECT 100-100V
C13	★87-010-405-019	CAP,ELECT 10-50V SME
C14	★87-010-408-019	CAP,ELECT 47-50VX
C101	★87-018-121-019	CAP,CERA SS 150P
C102	★87-018-121-019	CAP,CERA SS 150P
C103	★87-018-120-019	CAP,CERA 120P
C104	★87-018-120-019	CAP,CERA 120P
C109	★87-018-126-019	CAP,CERA SS 390P
C110	★87-018-126-019	CAP,CERA SS 390P
C111	★87-010-679-019	CAP,ELECT 10-16V KS
C112	★87-010-679-019	CAP,ELECT 10-16V KS
C113	★87-010-679-019	CAP,ELECT 10-16V KS
C114	★87-010-679-019	CAP,ELECT 10-16V KS
C117	★87-018-134-019	CAP,CERA SS 0.01
C201	★87-018-121-019	CAP,CERA SS 150P
C202	★87-018-121-019	CAP,CERA SS 150P
C203	★87-018-121-019	CAP,CERA SS 150P
C204	★87-018-121-019	CAP,CERA SS 150P
C209	★87-018-126-019	CAP,CERA SS 390P
C210	★87-018-126-019	CAP,CERA SS 390P
C211	★87-010-679-019	CAP,ELECT 10-16V KS
C212	★87-010-679-019	CAP,ELECT 10-16V KS
C213	★87-010-679-019	CAP,ELECT 10-16V KS
C214	★87-010-679-019	CAP,ELECT 10-16V KS
C217	★87-018-134-019	CAP,CERA SS 0.01
C311	★87-018-197-019	CAP,CERA SS 1800P
C312	★87-018-197-019	CAP,CERA SS 1800P
C315	★87-010-404-019	CAP,ELECT 4.7-50V SME
C316	★87-010-404-019	CAP,ELECT 4.7-50V SME
C317	★87-018-132-019	CAP,CERA SS 2200P
C318	★87-018-132-019	CAP,CERA SS 2200P
C319	★87-018-119-019	CAP,CERA SS 100P
C320	★87-018-119-019	CAP,CERA SS 100P
C371	★87-010-408-019	CAP,ELECT 47-50VX
C372	★87-010-401-019	CAP,ELECT 1-50V
C373	★87-010-381-019	CAP,ELECT 330-16V SME
C375	★87-018-133-019	CAP,CERA SS 4700P
C378	★87-014-077-010	CAP,PP 6800P
C379	★87-018-131-019	CAP,CERA SS 1000P
C405	★87-018-197-019	CAP,CERA SS 1800P
C406	★87-018-197-019	CAP,CERA SS 1800P
C413	★87-018-197-019	CAP,CERA SS 1800P
C414	★87-018-197-019	CAP,CERA SS 1800P
C421	★87-010-404-019	CAP,ELECT 4.7-50V SME
C422	★87-010-404-019	CAP,ELECT 4.7-50V SME
C423	★87-018-132-019	CAP,CERA SS 2200P
C424	★87-018-132-019	CAP,CERA SS 2200P
C425	★87-018-119-019	CAP,CERA SS 100P
C426	★87-018-119-019	CAP,CERA SS 100P
C471	★87-010-408-019	CAP,ELECT 47-50VX
C472	★87-010-401-019	CAP,ELECT 1-50V
C473	★87-010-381-019	CAP,ELECT 330-16V SME
C475	★87-018-133-019	CAP,CERA SS 4700P
C478	★87-014-077-010	CAP,PP 6800P
C479	★87-018-131-019	CAP,CERA SS 1000P
C501	★87-018-131-019	CAP,CERA SS 1000P
C502	★87-018-131-019	CAP,CERA SS 1000P
C511	★87-018-130-019	CAP,CERA 820P
C512	★87-018-130-019	CAP,CERA 820P
C515	★87-018-121-019	CAP,CERA SS 150P
C516	★87-018-121-019	CAP,CERA SS 150P
C601	★87-018-131-019	CAP,CERA SS 1000P
C602	★87-018-131-019	CAP,CERA SS 1000P
C607	★87-018-134-019	CAP,CERA SS 0.01
C608	★87-018-134-019	CAP,CERA SS 0.01
C611	★87-018-130-019	CAP,CERA 820P
C612	★87-018-130-019	CAP,CERA 820P
C615	★87-018-121-019	CAP,CERA SS 150P
C616	★87-018-121-019	CAP,CERA SS 150P
C617	★87-010-260-019	CAP,ELECT 47-25V
C618	★87-010-263-019	CAP,ELECT 100-10V
C701	★87-010-405-019	CAP,ELECT 10-50V SME
C702	★87-010-405-019	CAP,ELECT 10-50V SME
C703	★87-018-133-019	CAP,CERA SS 4700P
C704	★87-018-133-019	CAP,CERA SS 4700P

REF.NO.	PART NO.	DESCRIPTION
C711	★87-010-400-019	CAP,ELECT 0.47-50V SME
C712	★87-010-400-019	CAP,ELECT 0.47-50V SME
C713	★87-010-677-019	CAP,ELECT 0.15-50V SRA
C714	★87-010-677-019	CAP,ELECT 0.15-50V SRA
C717	★87-010-545-019	CAP,ELECT 0.22-50V SME
C718	★87-010-545-019	CAP,ELECT 0.22-50V SME
C731	★87-010-404-019	CAP,ELECT 4.7-50V SME
C732	★87-010-404-019	CAP,ELECT 4.7-50V SME
C751	★87-015-242-019	CAP,ELECT 2.2-50V LL
C752	★87-015-242-019	CAP,ELECT 2.2-50V LL
C761	★87-010-404-019	CAP,ELECT 4.7-50V SME
C762	★87-010-404-019	CAP,ELECT 4.7-50V SME
C763	★87-010-401-019	CAP,ELECT 1-50V
C764	★87-010-401-019	CAP,ELECT 1-50V
C765	★87-010-263-019	CAP,ELECT 100-10V
C766	★87-010-263-019	CAP,ELECT 100-10V
C767	★87-018-209-019	CAP,CERA SS 0.1
C801	★87-018-133-019	CAP,CERA SS 4700P
C802	★87-018-164-019	CAP,CERA SS 2.2P UJ
C803	★87-018-133-019	CAP,CERA SS 4700P
C804	★87-012-105-019	CAP,CERA 0.022 16V Y
C805	★87-010-401-019	CAP,ELECT 1-50V
C806	★87-010-384-019	CAP,ELECT 100-25V
C807	★87-010-252-019	CAP,ELECT 1000-6.3V
C808	★87-018-134-019	CAP,CERA SS 0.01
C809	★87-010-401-019	CAP,ELECT 1-50V
C812	★87-010-402-019	CAP,ELECT 2.2-50V SME
C813	★87-010-382-019	CAP,ELECT 22-25V SME
C814	★87-010-402-019	CAP,ELECT 2.2-50V SME
C815	★87-010-382-019	CAP,ELECT 22-25V SME
C816	★87-010-565-019	CAP,ELECT 470-12V SME
C817	★87-010-565-019	CAP,ELECT 470-12V SME
C818	★87-010-565-019	CAP,ELECT 470-12V SME
C819	★87-010-565-019	CAP,ELECT 470-12V SME
C821	★87-010-401-019	CAP,ELECT 1-50V
C822	★87-010-401-019	CAP,ELECT 1-50V
C823	★87-010-402-019	CAP,ELECT 2.2-50V SME
C825	★87-010-260-019	CAP,ELECT 47-25V
C826	★87-010-385-019	CAP,ELECT 220-25V
C827	★87-018-131-019	CAP,CERA SS 1000P
C902	★87-010-384-019	CAP,ELECT 100-25V
CF801	★87-030-167-019	CERA LOCK CST4.0 MHZ
⚠FR1	87-029-017-010	RES,FUSE 1/4W 10 (EXCEPT U)
J761	84-790-635-019	JACK,6.3(PHONES)
L301	★82-194-634-010	COIL,10 MMH
L302	★82-194-634-010	COIL,10 MMH
L303	★82-231-622-010	COIL,22 MMH-J
L304	★82-231-622-010	COIL,22 MMH-J
L371	★84-790-621-010	COIL,BIAS 105K AMO
L401	★87-003-128-019	MICRO INDUCTOR 5.6 MMH
L402	★87-003-128-019	MICRO INDUCTOR 5.6 MMH
L403	★87-003-131-019	MICRO INDUCTOR 10 MMH
L404	★87-003-131-019	MICRO INDUCTOR 10 MMH
L405	★82-231-622-010	COIL,22 MMH-J
L406	★82-231-622-010	COIL,22 MMH-J
L471	★84-790-621-010	COIL,BIAS 105K AMO
L501	★84-790-622-010	COIL,HX105K AMO
L502	★84-790-622-010	COIL,HX105K AMO
L601	★84-790-622-010	COIL,HX105K AMO
L602	★84-790-622-010	COIL,HX105K AMO
L701	★84-790-623-019	FILTER,DOLBY LPF 105K
L702	★84-790-623-019	FILTER,DOLBY LPF 105K
L703	★82-231-622-010	COIL,22 MMH-J
L704	★82-231-622-010	COIL,22 MMH-J

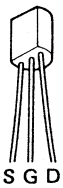
REF.NO.	PART NO.	DESCRIPTION
⚠R935	87-029-079-010	RES,MO 100-1W
⚠R936	87-025-338-010	RES,MO 2.2-1W(U)
SFR101	★87-024-168-019	SFR,1K
SFR102	★87-024-168-019	SFR,1K
SFR201	★87-024-168-019	SFR,1K
SFR202	★87-024-168-019	SFR,1K
SFR301	★87-024-169-019	SFR,2.2K
SFR302	★87-024-169-019	SFR,2.2K
SFR401	★87-024-169-019	SFR,2.2K
SFR402	★87-024-169-019	SFR,2.2K
SFR501	★87-024-176-019	SFR,100K
SFR502	★87-024-176-019	SFR,100K
SFR601	★87-024-176-019	SFR,100K
SFR602	★87-024-176-019	SFR,100K
SFR801	★87-024-177-019	SFR,220K
VR551	84-790-632-019	VR,250KB(BIAS FINE)(D1)
VR651	84-790-632-019	VR,250KB(BIAS FINE)(D2)
VR751	84-790-631-019	VR,100KW(BALANCE)
VR752	84-790-630-019	VR,50KA(REC LEVEL)
=== FRONT CIRCUIT BOARD SECTION ===		
C901	★87-010-234-019	CAP,ELECT 47-16V SRE
FL1	84-790-620-010	FL,CP5387 GR(METER/COUNTER)
LED901	87-001-745-010	LED,SEL1324G(PLAY)(D2)
LED902	84-792-625-019	LED,SLH-38YC,H15.5(PAUSE)(D2)
LED903	84-792-625-019	LED,SLH-38YC,H15.5(PAUSE)(D1)
LED904	84-792-624-019	LED,SLH-38VC,H15.5(DUAL REC/HIGH)
LED905	87-001-745-010	LED,SEL1324G(PLAY)(D1)
LED906	84-792-624-019	LED,SLH-38VC,H15.5(REC/REC MUTE)(D2)
LED907	84-792-625-019	LED,SLH-38YC,H15.5(REC/REC MUTE)(D1)
LED908	84-792-624-019	LED,SLH-38VC,H15.5(SYNC.DUBB.NORMAL)
S901	87-036-170-019	TACT SW(▷)(D1)
S902	87-036-170-019	TACT SW(◁)(D1)
S903	87-036-170-019	TACT SW(▷▷)(D1)
S904	87-036-170-019	TACT SW(◁◁)(D1)
S905	87-036-170-019	TACT SW(STOP)(D1)
S906	87-031-863-019	TACT SW(PAUSE)(D1)
S907	87-031-863-019	TACT SW(REC/REC MUTE)(D1)
S908	87-036-170-019	TACT SW(SYNC.DUBB.NORMAL)
S909	87-036-170-019	TACT SW(▷)(D2)
S910	87-036-170-019	TACT SW(◁)(D2)
S911	87-036-170-019	TACT SW(▷▷)(D2)
S912	87-036-170-019	TACT SW(◁◁)(D2)
S913	87-036-170-019	TACT SW(STOP)(D2)
S914	87-031-863-019	TACT SW(PAUSE)(D2)
S915	87-031-863-019	TACT SW(REC/REC MUTE)(D2)
S916	87-036-170-019	TACT SW(SYNC.DUBB.HIGH)
S917	87-036-170-019	TACT SW(COUNTER RESET)(D1)
S918	87-036-170-019	TACT SW(COUNTER RESET)(D2)
S919	87-036-170-019	TACT SW(DUAL REC)
S920	84-790-637-019	SLIDE SW(TIMER)
S921	84-790-637-019	SLIDE SW(STSD)
S922	84-790-637-019	SLIDE SW(DOLBY NR)
S923	84-790-636-019	SLIDE SW(BLANK SKIP)
=== PIN JACK CIRCUIT BOARD SECTION ===		
C753	★87-018-134-019	CAP,CERA SS 0.01
J751	87-009-023-019	JACK PIN(R/LINE IN,P/LINE OUT)
=== DECK-1 CIRCUIT BOARD SECTION ===		
S1	87-036-109-010	PUSH SW SPPB61(CAST)
S2	87-036-110-010	PUSH SW SPPB62(CRO2)
S3	87-036-110-010	PUSH SW SPPB62(REA)
S4	87-036-109-010	PUSH SW SPPB61(REB)

REF.NO.	PART NO.	DESCRIPTION
S5	87-036-109-010	PUSH SW SPPB61(METAL)
SFR1	★87-024-291-019	SFR,4.7K
SFR2	★87-024-291-010	SFR,4.7K
SOL1	★86-535-611-210	SOL,X-3 PL(PLAY)
SOL2	★86-535-612-210	SOL,X-3 FR(FRP)
		＝＝＝ DECK-2 CIRCUIT BOARD SECTION ＝＝＝
S1	87-036-109-010	PUSH SW SPPB61(CAST)
S2	87-036-110-010	PUSH SW SPPB62(CRO2)
S3	87-036-110-010	PUSH SW SPPB62(REA)
S4	87-036-109-010	PUSH SW SPPB61(REB)
S5	87-036-109-010	PUSH SW SPPB61(METAL)
SFR1	★87-024-291-019	SFR,4.7K
SFR2	★87-024-291-019	SFR,4.7K
SOL1	★86-535-611-210	SOL,X-3 PL(PLAY)
SOL2	★86-535-612-210	SOL,X-3 FR(FRP)
		＝＝＝ SENSOR-1 CIRCUIT BOARD SECTION ＝＝＝
CP1	87-001-367-019	PHOTO,SPI-315(0)CD
		＝＝＝ SENSOR-2 CIRCUIT BOARD SECTION ＝＝＝
CP1	87-001-367-019	PHOTO,SPI-315(0)CD
		＝＝＝ RELAY-1 CIRCUIT BOARD SECTION ＝＝＝
		＝＝＝ RELAY-2 CIRCUIT BOARD SECTION ＝＝＝
		＝＝＝ POWER CIRCUIT BOARD SECTION ＝＝＝
⚠	87-033-147-019	FUSE CLAMP(EXCEPT U)
⚠C15	★87-019-112-019	CAP,LINE 0.01E
⚠FU1	87-035-191-019	FUSE,3.15A 250V T E(H,E,K,Z)
⚠FU1	87-035-367-010	FUSE,3.15A 250V T E(H,E,K,Z)
⚠PT1	84-790-611-019	POWER TRANSFORMER H(H)
⚠PT1	84-790-612-019	POWER TRANSFORMER U,C(U)
⚠PT1	84-790-613-019	POWER TRANSFORMER E,Z(E,Z)
⚠PT1	84-790-614-019	POWER TRANSFORMER K(K)
⚠S1	87-036-015-019	PUSH SW(POWER)
⚠S2	87-036-136-019	ROTARY SW(VOLTAGE SELECTOR)(H)
		＝＝＝ MISCELLANEOUS ＝＝＝
⚠	★82-187-796-019	AC CORD (BS)(K)
⚠	★82-187-797-019	AC CORD (E)(E,Z)
⚠	★87-034-584-019	AC CORD (U)SPT-2(U)
⚠	★87-034-749-019	AC CORD (H) W/PLUG(H)
⚠	★87-085-184-010	AC CORD BUSHING D(H)
⚠	★87-085-185-010	AC CORD BUSHING E(E,K,Z)
⚠	★87-085-189-010	AC CORD BUSHING (SPT-2)(U)
M1	87-045-235-010	MOTOR,MMA6B2LW(D1)
M2	87-045-235-010	MOTOR,MMA6B2LW(D2)
RPEH1	87-046-325-010	HEAD,RPEH(D1)
RPEH2	87-046-325-010	HEAD,RPEH(D2)

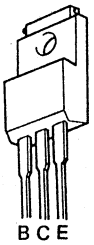
2SA933
2SA952
2SA1015
2SA1296
2SC1740
2SC1815
2SC2001
2SD1302



2SC3113
DTC114
RN2206



2SK373

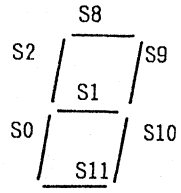


2SB1015
2SD1406

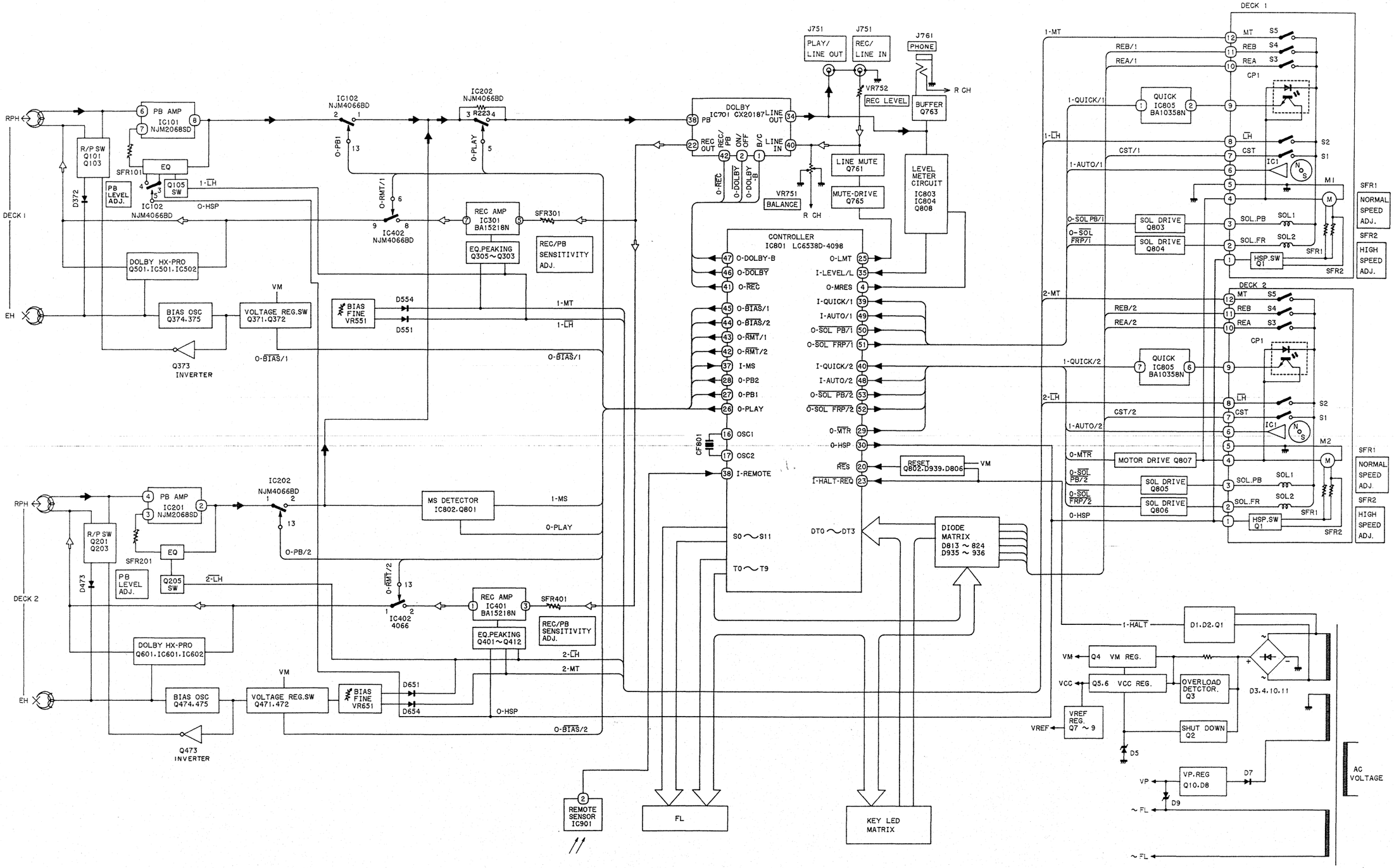
MATRIX TABLE

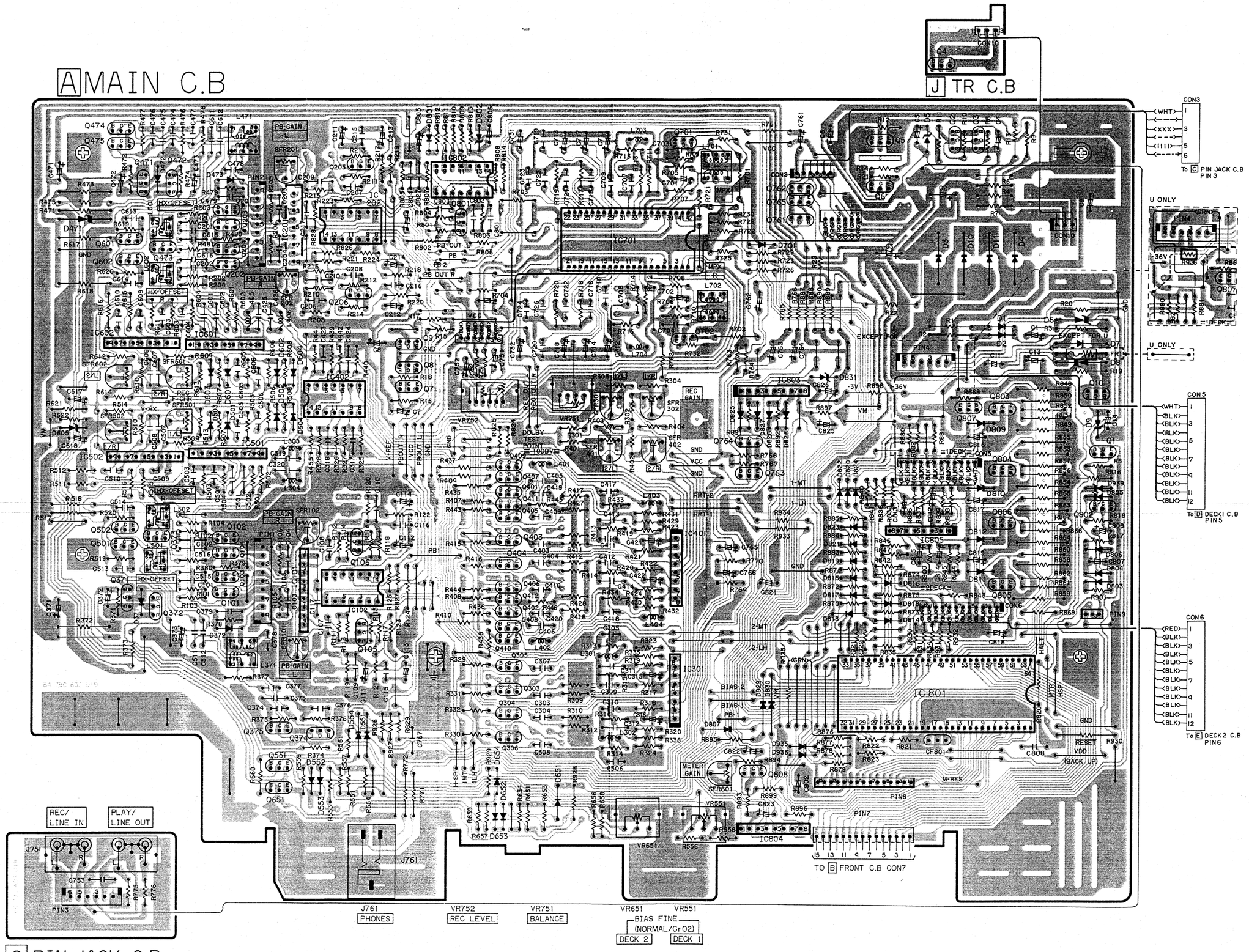
	DISPLAY SECTION											
	S0	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11
T0	DECK1 10^3 7 SEG.			DECK1	DECK2	DECK1		DUB.	DECK1 10^3 7 SEG.			
T1	DECK1 10^2 7 SEG.			PLAY	REC RMT	REC RMT	---	LED	DECK1 10^2 7 SEG.			
T2	DECK1 10^1 7 SEG.			LED	LED	LED			DECK1 10^1 7 SEG.			
T3	DECK1 10^0 7 SEG.			D1:<	D1:>	(B)	(C)	---	DECK1 10^0 7 SEG.			
T4	DECK2 10^3 7 SEG.			---	---	D2:<	D2:>	---	DECK2 10^3 7 SEG.			
T5	DECK2 10^2 7 SEG.			DECK2	DECK2	DECK1		DUAL REC	DECK2 10^2 7 SEG.			
T6	DECK2 10^1 7 SEG.			PLAY	PAUSE	PAUSE	---	LED	DECK2 10^1 7 SEG.			
T7	DECK2 10^0 7 SEG.			LED	LED	LED			DECK2 10^0 7 SEG.			
T8	LOWER ---------- 12 POINT PEAK HOLD METER / LEFT ---------- HIGHER											
T9	LOWER ---------- 12 POINT PEAK HOLD METER / RIGHT ---------- HIGHER											

	INPUT SECTION			
	DT0	DT1	DT2	DT3
T0	FWD PLAY/D1	REV PLAY/D1	>>/D1	<</D1
T1	STOP/D1	PAUSE/D1	REC/RMT/D1	NOR DUB.
T2	FWD PLAY/D2	REV PLAY/D2	>>/D2	>>/D2
T3	STOP/D2	PAUSE/D2	REC/RMT/D2	HI DUB.
T4	RESET/D1	RESET/D2	---	DUAL REC
T5	TIMER REC	TIMER PLAY	ONE WAY MODE	REVERSE MODE
T6	DOLBY C	DOLBY B	---	BLANK SKIP
T7	RE-A/D1	RE-B/D1	---	CST/D1
T8	RE-A/D2	RE-B/D2	---	CST/D2
T9	MODE:DUAL-REC	MODE:D2	---	---

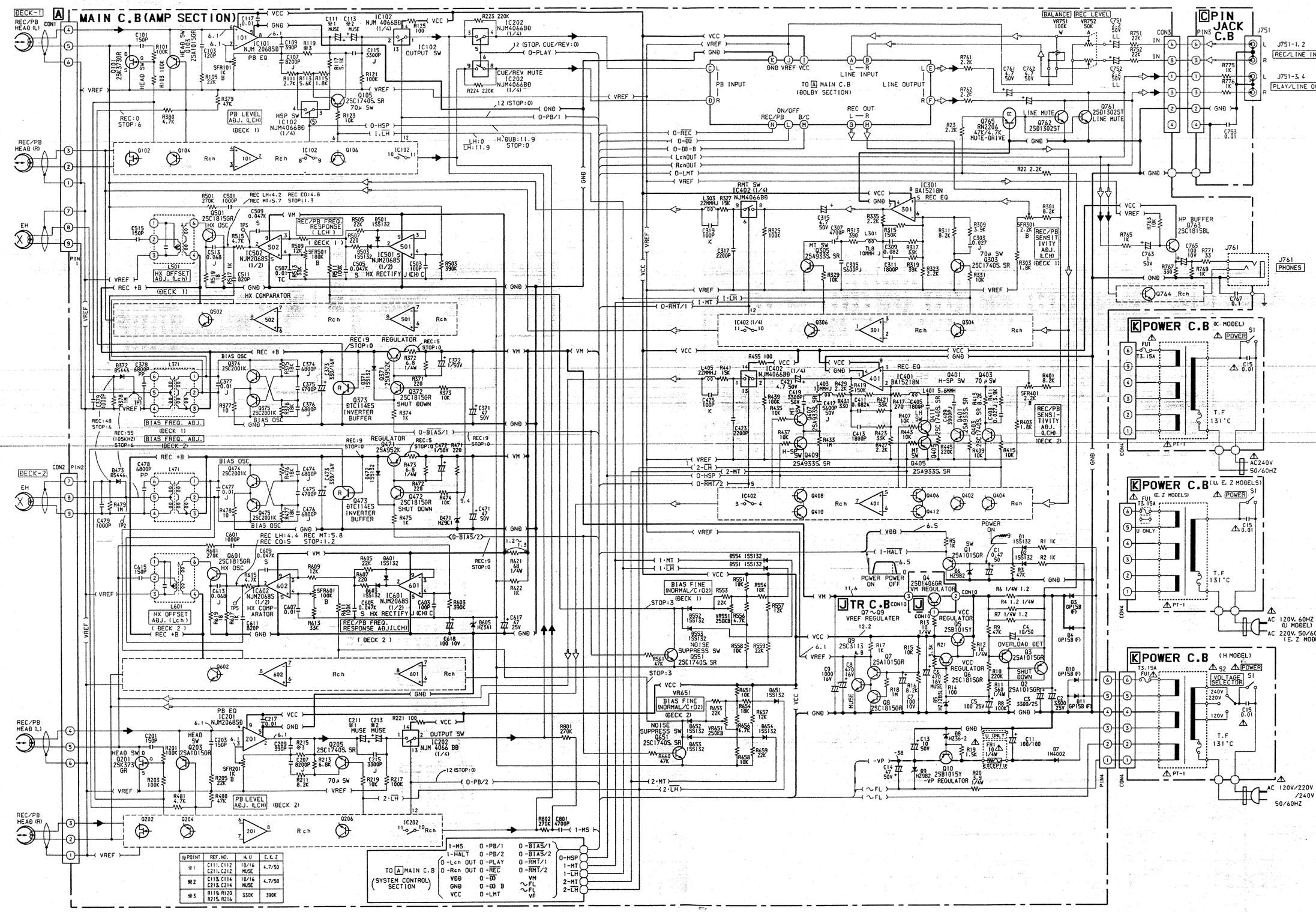


BLOCK DIAGRAM



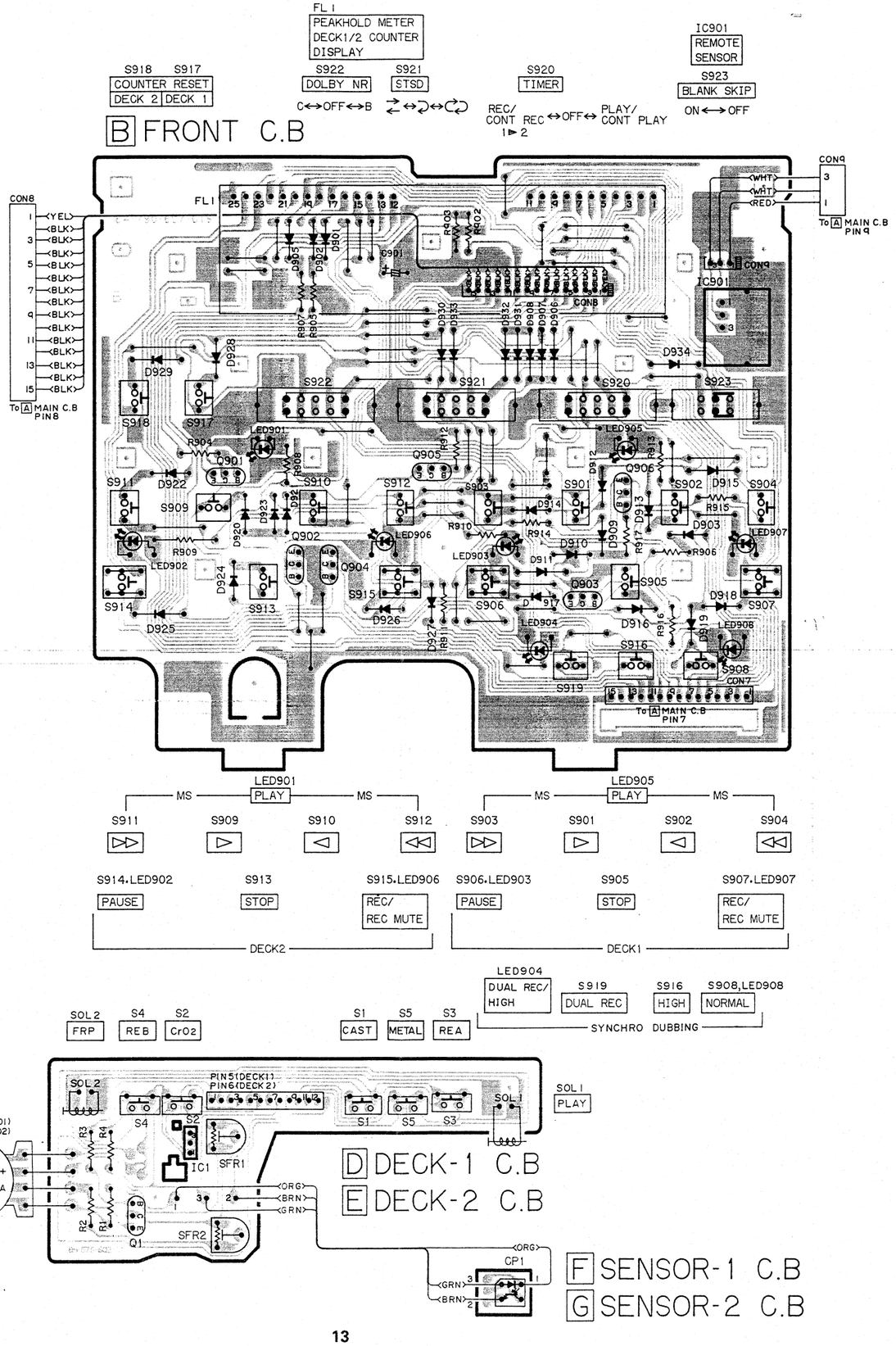

A MAIN C.B
J TR C.B
C PIN JACK C.B
REC/ LINE IN
PLAY/ LINE OUT
J751
PIN3
J761 PHONES
VR752 REC LEVEL
VR751 BALANCE
VR651 VR551
BIAS FINE (NORMAL/CrO2)
DECK 2
DECK 1
CON3
To C PIN JACK C.B PIN 3
U ONLY
CON10
CON5
To D DECK1 C.B PIN5
CON6
To E DECK2 C.B PIN6
TO B FRONT C.B CON7
IC801
IC804
IC701
IC301
IC401
IC803
IC805
PB-GAIN
HX-OFFSET
REC GAIN
METER GAIN
M-RES
BIAS-2
BIAS-1
PB-2
PB-1
2-MT
2-LH
1-MT
1-LH
EXCEPT FOR U
2DECK
1DECK

SCHEMATIC DIAGRAM – 1

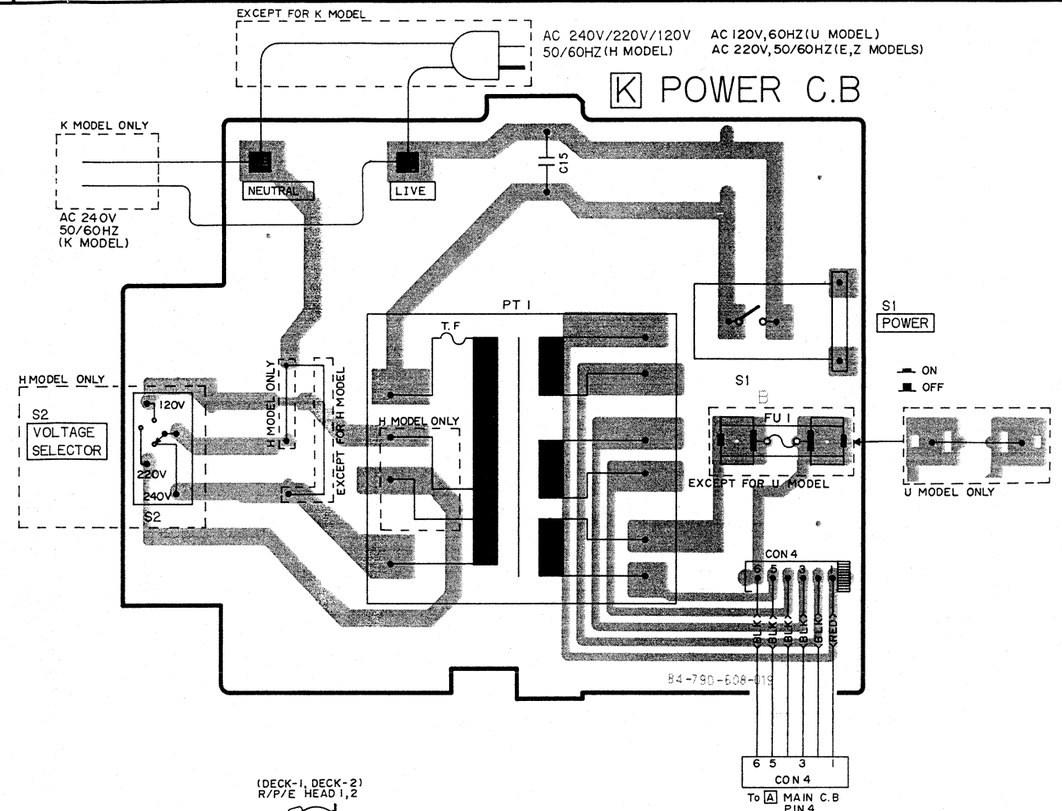


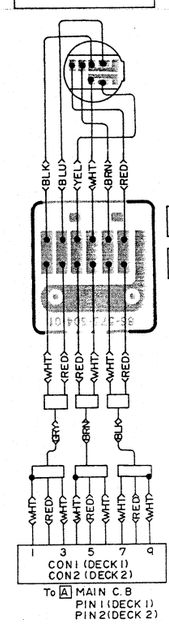
※POINT	REF.NO.	H, U	E, K, Z
※1	C111, C112 C211, C212	10/16 MUSE	4.7/50
※2	C113, C114 C213, C214	10/16 MUSE	4.7/50
※3	R119, R120 R215, R216	330K	390K

B FRONT C.B



K POWER C.B





H RELAY-1 C.B

I RELAY-2 C.B

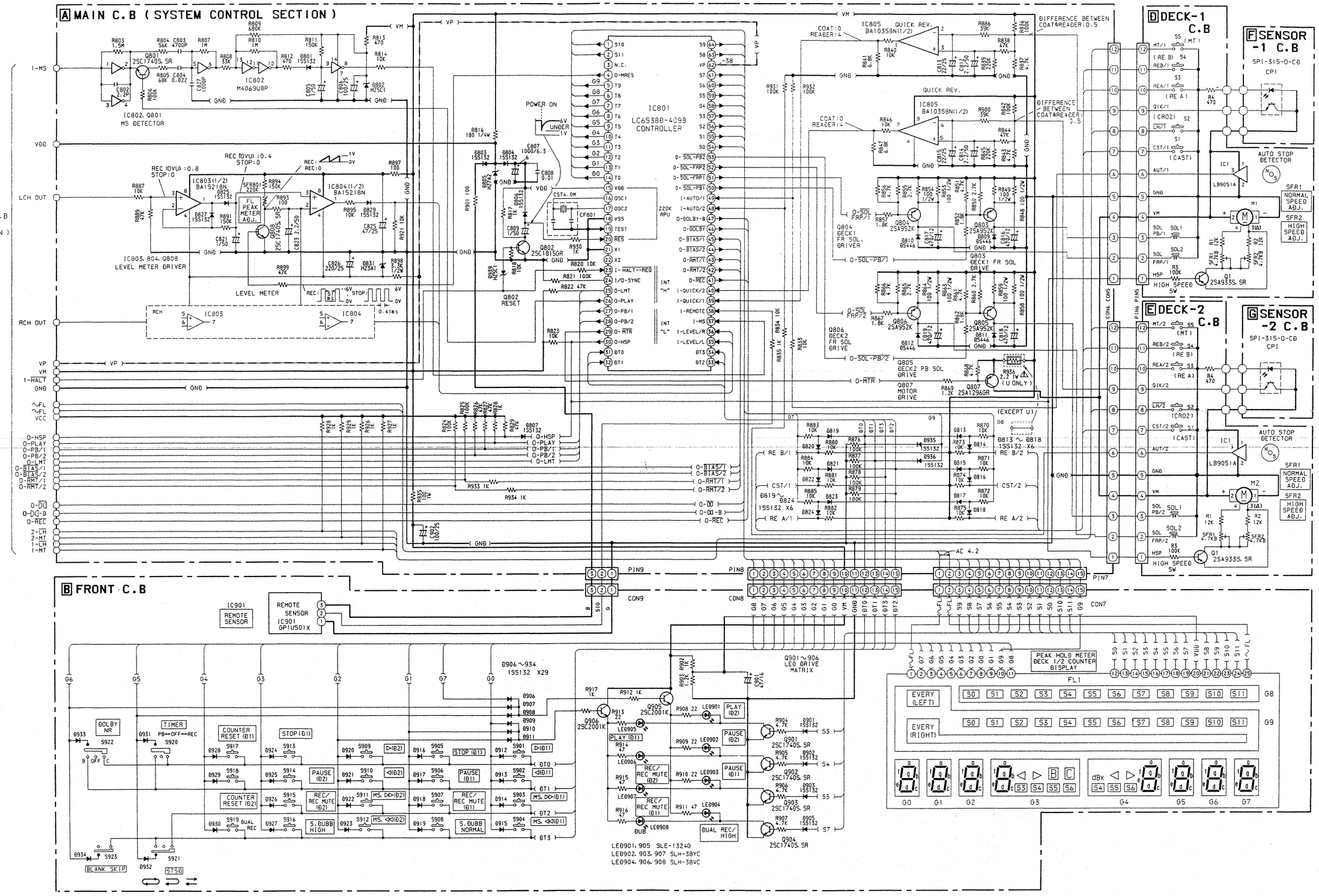
D DECK-1 C.B

E DECK-2 C.B

F SENSOR-1 C.B

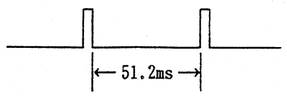
G SENSOR-2 C.B

SCHEMATIC DIAGRAM – 2



IC DESCRIPTION

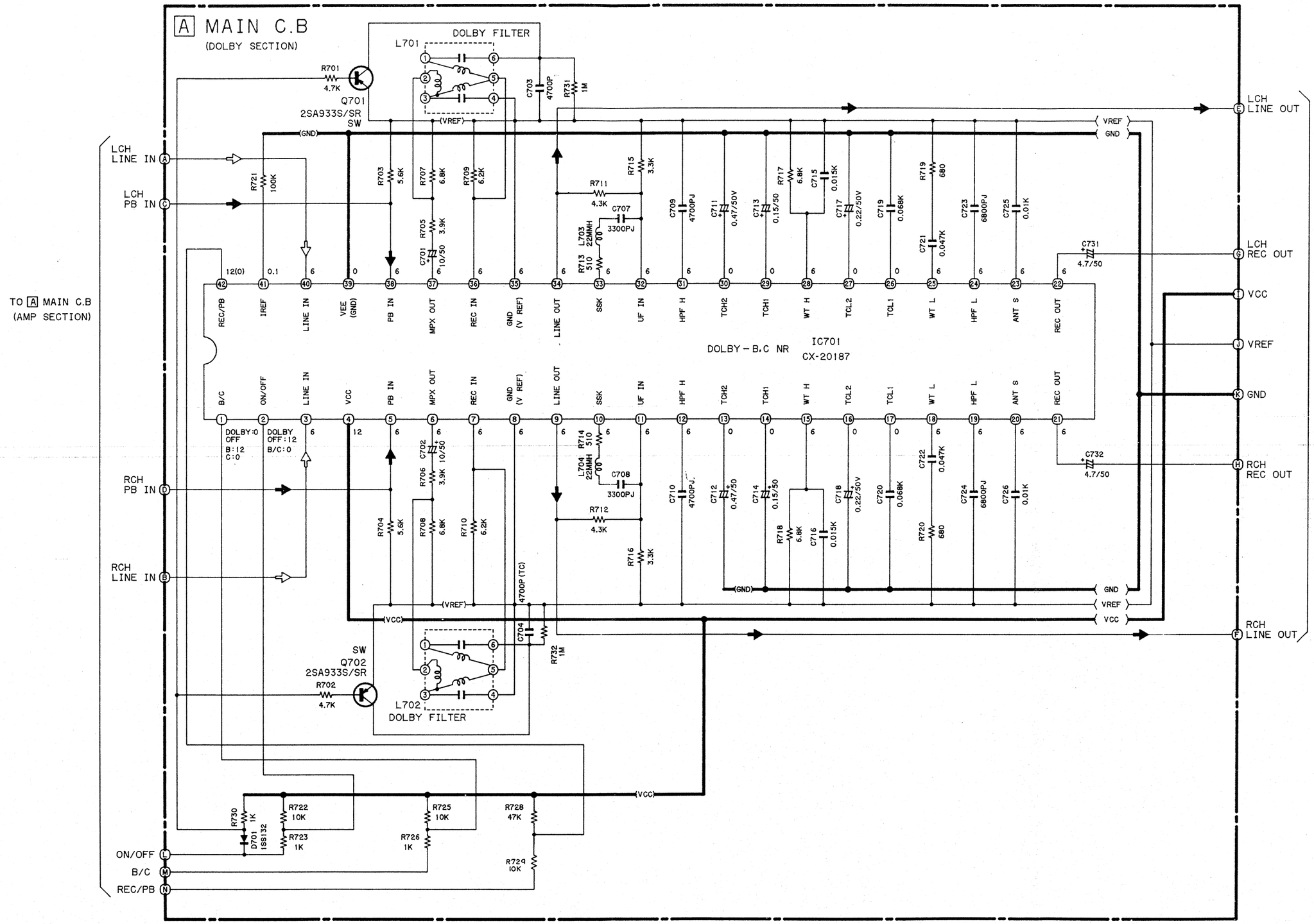
IC, LC6538D-4098

Pin No.	Pin Name	I/O	Description
1	S10	O	FL display segment outputs.
2	S11	O	
3	——	—	Unused.
4	O-MRES	O	Level meter T/V conversion reset pulse. 
5 ⟆ 14	T9 ⟆ T0	O	FL display grid outputs and key scan outputs.
15	VDD	—	Power supply pin (+6V).
16	OSC1	—	A ceramic oscillator is connected (4MHz).
17	OSC2		
18	Vss	—	Power supply remote control terminal (GND).
19	TEST	I	Connected to ground.
20	$\overline{RES}$	I	Reset input. "L" input resets the IC.
21	X1	—	Connected to ground.
22	X2	—	Unused.
23	I-$\overline{HALT-REQ}$	I	Hold request input. When the power switch is turned off, this pin goes "L" and the IC enters the low current consumption mode and the direction of tape running is stored.
24	I/O-SYNC	I/O	Unused.
25	O-LMT	O	LINE MUTE output. "H" output mutes a signal.
26	O-PLAY	O	CUE/REVIEW MUTE output and MS gain control terminal. Goes "H" during PLAY and "L" during CUE, REVIEW and MS.
27	O-PB/1	O	DECK 1 playback sound control pin. Goes "H" when DECK 1 is playing. When DECKs 1 and 2 are playing, only pin ㉘ goes "H".
28	O-PB/2	O	DECK 2 playback sound control pin. Goes "H" when DECK 2 is playing.
29	O-$\overline{MTR}$	O	Motor on/off control pin. "L" output turns the motor.
30	O-HSP	O	Motor speed control pin. Outputs "H" during double speed.
31 ⟆ 34	DT0 ⟆ DT3	I	Key scan inputs.
35	I-LEVEL/L	I	Lch level meter signal input.
36	I-LEVEL/R	I	Rch level meter signal input.
37	I-MS	I	MS signal input.
38	I-REMOTE	I	Remote control input.
39	I-QUICK/1	I	DECK 1 quick reverse signal input. "H" input reverse the tape.
40	I-QUICK/2	I	DECK 2 quick reverse signal input.
41	O-$\overline{REC}$	O	Dolby NR IC recording/playback mode switching pin. Goes "L" during recording and "L" during play and dubbing.
42	O-$\overline{RMT-2}$	O	DECK 2 REC MUTE control pin. "L" output turns REC MUTE on.
43	O-$\overline{RMT-1}$	O	DECK 1 REC MUTE control pin. "L" output turns REC MUTE on.
44	O-$\overline{BIAS-2}$	O	DECK 2 BIAS OSC control pin. "L" output causes oscillations.
45	O-$\overline{BIAS-1}$	O	DECK 1 BIAS OSC control pin. "L" output causes oscillations.
46	O-$\overline{DOLBY}$	O	Dolby NR on/off control pin. "L" output turns Dolby NR on.
47	O-DOLBY-B	O	Dolby B/C NR control pin. "H" output activates Dolby B NR.

Pin No.	Pin Name	I/O	Description
48	I-AUTO/2	I	DECK 2 tape end detection signal input. When there is no change in the input for a predetermined time, the tape is reversed and then stops. (It is set to 4 sec during play and recording and 0.5 sec during fast forward and rewind.
49	I-AUTO/1	I	DECK 1 tape end detection signal input.
50	O-$\overline{SOL-PB/1}$	O	DECK 1 play solenoid control pin.
51	O-$\overline{SOL-FRP/1}$	O	DECK 1 pause solenoid control pin.
52	O-$\overline{SOL-FRP/2}$	O	DECK 2 pause solenoid control pin.
53	O-$\overline{SOL-PB/2}$	O	DECK 2 play solenoid control pin.
54 ⟆ 61 63 64	S0 ⟆ S7 S8 S9	O	FL display segment ouputs.
62	VP	—	Power supply pin to light the FL display (-38V).

PRACTICAL SERVICE FIGURE

Playback output : TTA-200(TTA-161,TCC-130)	0.45V±1.5dB (LINE OUT)	Dolby NR effect : (TTA-610,CCIR Filter)	More than 8.5dB (B type) More than 17dB (C type)
PB/REC output : TTA-600(TTA-119K)	0VU±1.5dB (LINE OUT) 0VU±1.7dB (At Dubbing, Master tape TTA-200)	Recording bias frequency:	105kHz
		Tape speed : TTA-100(TTA-111S)	3kHz±1.5% (D1,2)
PB/REC distortion :	Less than 2.0% (MT,CrO_2,NORM.)	Wow & flutter : (W.R.M.S)	Less than 0.065% (D1,2)
Playback noise : (Unweighted)	(CrO_2,DOLBY NR C OFF/ON) Less than 2.5mV (NORM.,DOLBY NR OFF)	Take-up torque :	45±15 g-cm (D1,2) [0.44±0.15mN·m]
(DIN AUDIO)	Less than 1.5/1.0mV (CrO_2,DOLBY NR C OFF/ON) Less than 1.8mV (NORM.,DOLBY NR OFF)	F.FWD torque :	120±40 g-cm (D1,2) [1.18±0.39mN·m]
		Rewind torque :	120±40 g-cm (D1,2) [1.18±0.39mN·m]
Erase ratio (125kHz) :	More than 60dB	Back-tension :	3±2 g-cm (D1,2) [0.03±0.02mN·m]
Cross talk (PB) :	More than 60dB	Test tapes :	METAL TTA-620 (TTA-119MP)
Channel separation (PB):	More than 30dB		CrO_2 TTA-610 (TTA-119H)
Level drift :	Within 1dB		NORMAL TTA-600 (TTA-119K)
PB/REC S/N ratio : (Unweighted)	More than 43/48dB (MT,CrO_2,DOLBY NR C OFF/ON) More than 41/46dB (NORM.,DOLBY NR C OFF/ON)		
(Weighted-A)	More than 47/65dB (MT,CrO_2,DOLBY NR C OFF/ON) More than 45/65dB (NORM.,DOLBY NR C OFF/ON)		


A MAIN C.B
(DOLBY SECTION)
DOLBY FILTER
L701
R701 4.7K
Q701 2SA933S/SR SW
C703 4700P
R731 1M
(VREF)
(GND)
LCH LINE IN A
LCH PB IN C
R721 100K
R703 5.6K
R707 6.8K
R709 6.2K
R705 3.9K
C701 10/50
R711 4.3K
R715 3.3K
C707 3300PJ
L703 22MH
R713 510
C709 4700PJ
C711 0.47/50V
C713 0.15/50
R717 6.8K
C715 0.015K
C717 0.22/50V
C719 0.068K
R719 680
C721 0.047K
C723 6800PJ
C725 0.01K
C731 4.7/50
VREF
GND
LCH LINE OUT E
LCH REC OUT G
VCC I
VREF J
GND K
TO A MAIN C.B (AMP SECTION)
TO A MAIN C.B (AMP SECTION)
REC/PB
IREF
LINE IN
VEE (GND)
PB IN
MPX OUT
REC IN
GND (V REF)
LINE OUT
SSK
UF IN
HPF H
TCH2
TCH1
WT H
TCL2
TCL1
WT L
HPF L
ANT S
REC OUT
DOLBY-B.C NR
IC701
CX-20187
B/C
ON/OFF
VCC
DOLBY:0 OFF B:12 C:0
DOLBY OFF:12 B/C:0
C702 10/50
R706 3.9K
R708 6.8K
R710 6.2K
R714 510
L704 22MH
C708 3300PJ
R712 4.3K
R716 3.3K
C710 4700PJ
C712 0.47/50
C714 0.15/50
R718 6.8K
C716 0.015K
C718 0.22/50V
C720 0.068K
R720 680
C722 0.047K
C724 6800PJ
C726 0.01K
C732 4.7/50
RCH PB IN D
RCH LINE IN B
RCH REC OUT H
RCH LINE OUT F
4700P (TC)
C704
R732 1M
SW
Q702
2SA933S/SR
R702 4.7K
L702
DOLBY FILTER
R730 1K
D701 1SS132
R722 10K
R723 1K
R725 10K
R726 1K
R728 47K
R729 10K
ON/OFF L
B/C M
REC/PB N

ADJUSTMENT

Initial Settings

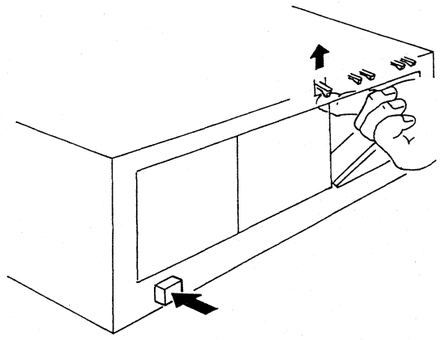
- BLANK SKIP : OFF
- TIMER : OFF
- STSD MODE : ⇄
- DOLBY NR : OFF
- BIAS FINE (DECK 1) : Center
- BIAS FINE (DECK 2) : Center
- BALANCE : Center
- REC LEVEL : Center
- OVU LEVEL : 1kHz, 320mV

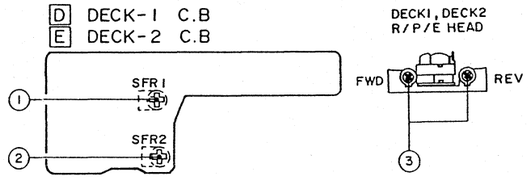
Tape Speed Adjustment

Set the unit to the test mode by the following procedure before performing speed adjustment. Be sure to perform normal speed adjustment first. If high speed adjustment is done first, adjustment will drift.

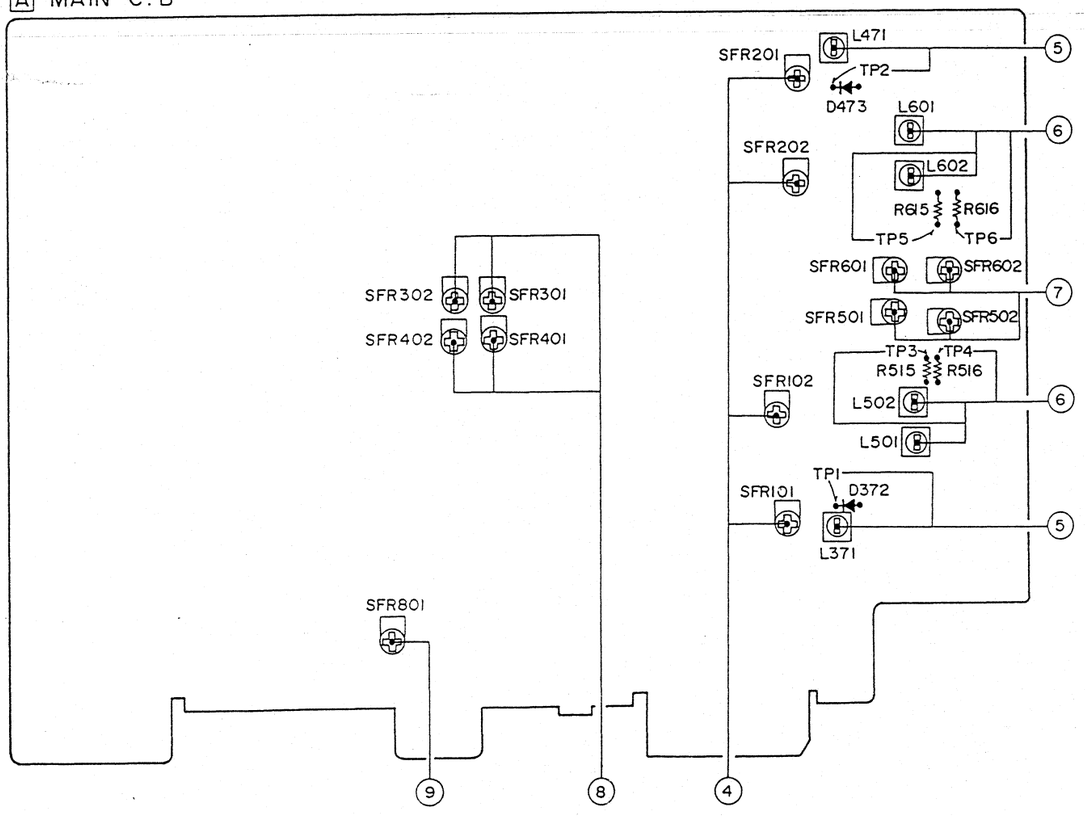
To set the test mode :

1. Turn the power switch off.
2. Open the cassette lid of DECK 2.
3. Turn the power switch on while pressing the miserasure prevention lever (FWD side) of DECK 2 as shown in the figure.
4. After several seconds, the FL display light showing that the unit has entered the test mode.





A MAIN C.B



1. Normal Speed Adjustment (DECK 1, DECK 2)
   Settings : • Test tape: TTA-100 (TTA-111S)
   • Test point: LINE OUT jack
   • Adjustment location: SFR1 on D DECK-1 C.B
   SFR1 on E DECK-2 C.B
   Method : Play the test tape and adjust so that the frequency is 3000Hz.

2. High Speed Adjustment (DECK 1, DECK 2)
   Settings : • Test tape: TTA-100 (TTA-111S)
   • Test point: LINE OUT jack
   • Adjustment location: SFR2 on D DECK-1 C.B
   SFR2 on E DECK-2 C.B
   Method :
   1. Set the unit to the test mode.
   2. Load test tape TTA-100 (TTA-111S).
   3. Press the PLAY button and then the HIGH button to set the unit to the high speed mode.
   4. Adjust SFR2 so that the frequency is 6000Hz.
   5. After adjustment is completed, press the HIGH button to set the unit to the normal speed mode.
   6. Press the STOP button.
   7. Turn the power switch off to release the test mode.
   Notes: (1) Keys other than the HIGH button will not operate in the high speed mode.
   (2) Do not turn the power switch off in the high speed mode.

3. Azimuth Adjustment (DECK 1, DECK 2)
   Settings : • Test tape: TTS-310 (TTA-317E)
   • Test point: LINE OUT jack
   • Adjustment location: Azimuth adjustment screws (DECK-1, DECK-2, FWD, REV)
   Method : Play the 10kHz signal of test tape and adjust so that the output is maximum and the waveforms in the Lissajours are in phase. Then tighten the screw slightly so that the output is within -0.5dB for the maximum value and the waveforms are within 90°.

4. Playback Level Adjustment (DECK 1, DECK 2)
   Settings : • Test tape: TTA-200 (TTA-161, TCC-130)
   • Test point: LINE OUT jack
   • Adjustment location: SFR101 (DECK 1, Lch)
   SFR102 (DECK 1, Rch)
   SFR201 (DECK 2, Lch)
   SFR202 (DECK 2, Rch)
   Method : Play the test tape and adjust so that the output level is 450mV±0.5dB.

5. Bias Frequency Adjustment (DECK 1, DECK 2)
   Settings : • Test tape: TTA-620 (TTA-119MP)
   • Test point: TP1 (D372 cathode, DECK 1)
   TP2 (D473 cathode, DECK 2)
   • Adjustment location: L371 (DECK 1)
   L471 (DECK 2)
   Method : Set to the record mode and adjust so that the frequency is 105kHz±0.3kHz.

6. HX Offset Adjustment (DECK 1, DECK 2)
   Settings : • Test tape: TTA-620 (TTA-119MP)
   • Test point: TP3 (R515, DECK 1, Lch)
   TP4 (R516, DECK 1, Rch)
   TP5 (R615, DECK 2, Lch)
   TP6 (R616, DECK 2, Rch)
   • Adjustment location: L501 (DECK 1, Lch)
   L502 (DECK 1, Rch)
   L601 (DECK 2, Lch)
   L602 (DECK 2, Rch)
   Method : Set to the record mode and adjust so that the bias voltage leaking to the test point is minimum.

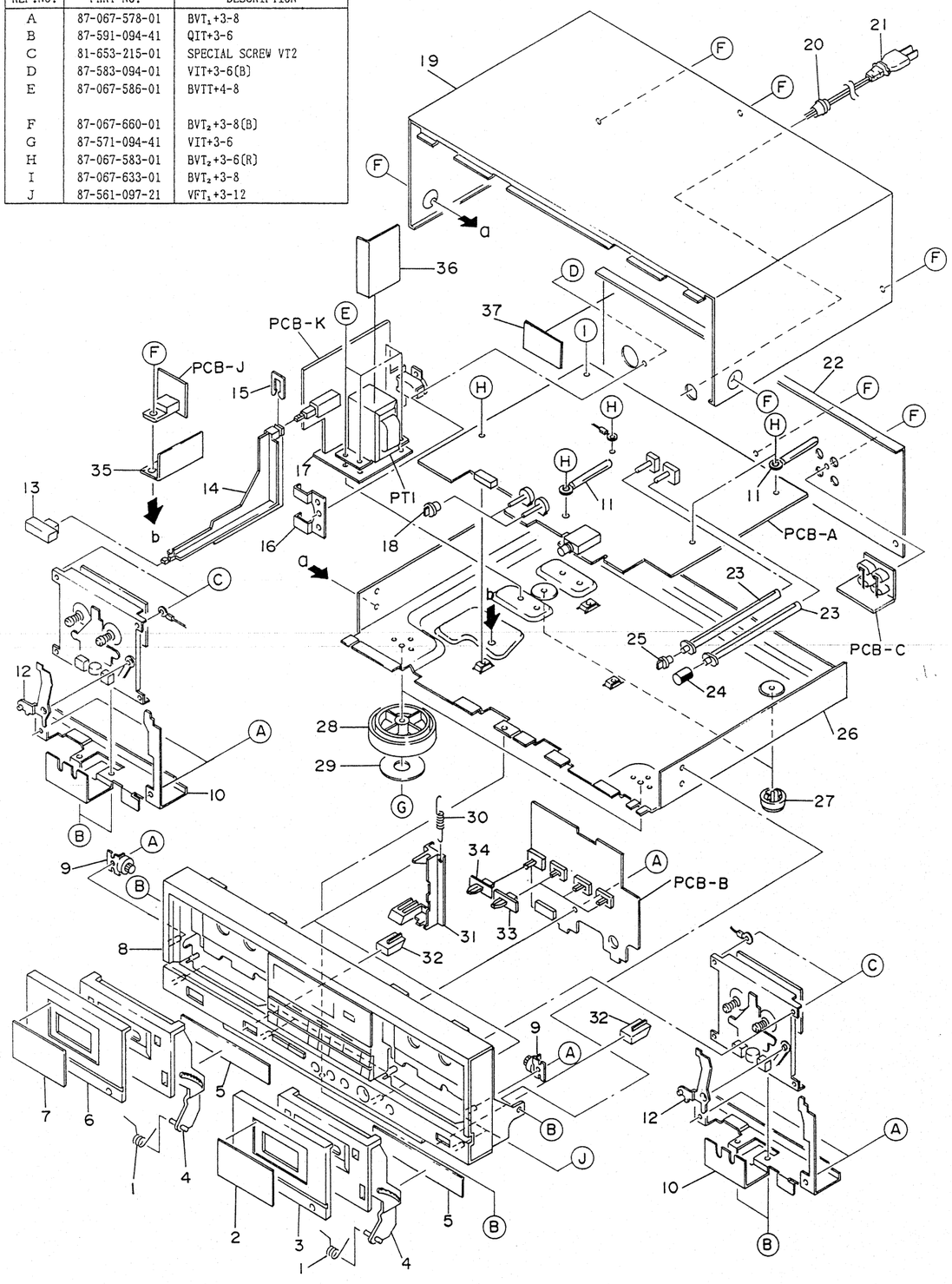
7. REC/PB Frequency Response Adjustment (DECK 1, DECK 2)
   Settings : • Test tape: TTA-600 (TTA-119K)
   • Input signal: 1kHz/10kHz (LINE IN jack)
   • Test point: LINE OUT jack
   • Adjustment location: SFR501 (DECK 1, Lch)
   SFR502 (DECK 1, Rch)
   SFR601 (DECK 2, Lch)
   SFR602 (DECK 2, Rch)
   Method : Apply a 1kHz signal and adjust an attenuator so that the output level is 32mV at LINE OUT jack. Record and play back the 1kHz and 10kHz signals and adjust so that the output level of 10kHz signal is +0.5dB±0.5dB for 1kHz signal.

8. REC/PB Sensitivity Adjustment (DECK 1, DECK 2)
   Settings : • Test tape: TTA-600 (TTA-119K)
   • Input signal: 1kHz (LINE IN jack)
   • Test point: LINE OUT jack
   • Adjustment location: SFR301 (DECK 1, Lch)
   SFR302 (DECK 1, Rch)
   SFR401 (DECK 2, Lch)
   SFR402 (DECK 2, Rch)
   Method : Apply a 1kHz signal and adjust an attenuator so that the output level is 32mV at LINE OUT jack. Record and play back the 1kHz signal and adjust so that the output is 32mV±0.5dB.

9. FL Peak Meter Adjustment (DECK 1)
   Settings : • Test tape: TTA-600 (TTA-119K)
   • Input signal: 1kHz (LINE IN jack)
   • Test point: LINE OUT jack
   • Adjustment location: SFR801
   Method : Apply a 1kHz signal of 320mV and record it to a test tape and adjust SFR801 so FL peak meter indicates 0VU. Play back the test tape and confirm that FL peak meter indicates +3dB (9 Blue LED light on).

EXPLODED VIEW – 1

REF.NO.	PART NO.	DESCRIPTION
A	87-067-578-01	BVT_1+3-8
B	87-591-094-41	QIT+3-6
C	81-653-215-01	SPECIAL SCREW VT2
D	87-583-094-01	VIT+3-6(B)
E	87-067-586-01	BVTT+4-8
F	87-067-660-01	BVT_2+3-8(B)
G	87-571-094-41	VIT+3-6
H	87-067-583-01	BVT_2+3-6(R)
I	87-067-633-01	BVT_2+3-8
J	87-561-097-21	VFT_1+3-12

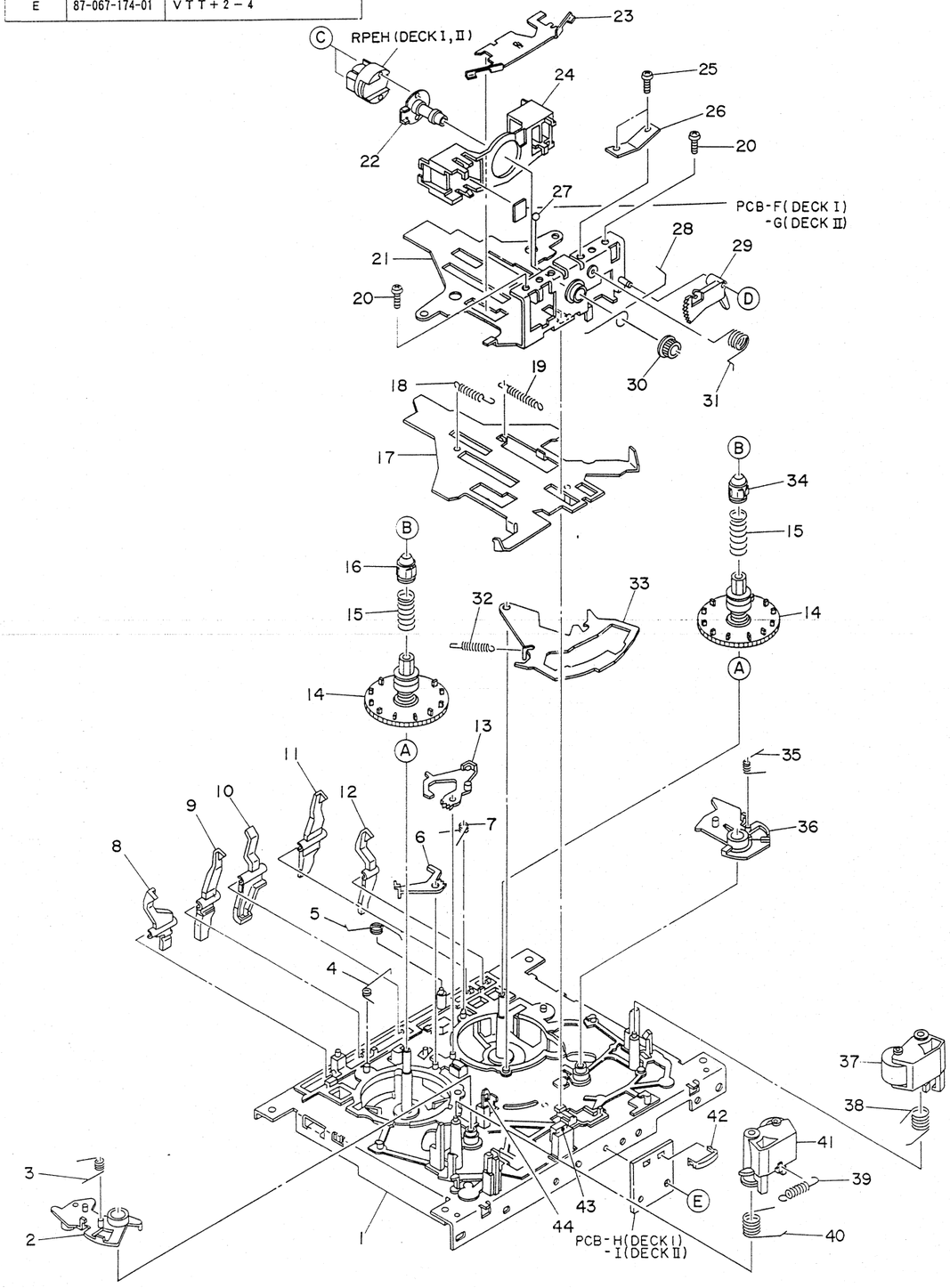


MECHANICAL PARTS LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	1-1	★84-790-208-019	T-SPRING,EJECT	*	2
	1-2	★84-790-027-019	WINDOW,CASSETTE BOX 2	*	1
	1-3	★84-790-031-019	PANEL,CASSETTE BOX 2	*	1
	1-4	★09-047-508-010	BOX CASSETTE ASSY(H,E,K,Z)	*	2
	1-4	★09-047-509-010	BOX CASSETTE ASSY(U)	*	2
	1-5	---	SHEET FOAMED MAT 250-25		2
	1-6	★84-790-030-019	PANEL,CASSETTE BOX 1	*	1
	1-7	84-790-026-019	WINDOW,CASSETTE BOX 1	*	1
	1-8	★09-047-531-010	CABINET FRONT ASSY(H,E,K,Z)	*	1
	1-8	★09-047-532-010	CABINET FRONT ASSY(U)	*	1
	1-9	★87-063-143-010	OIL-DAMP 75		2
	1-10	★84-790-207-019	HOLDER,MECHA	*	2
	1-11	---	WIRE BINDER		2
	1-12	★86-535-393-019	LEVER,EJECT STOPPER		2
	1-13	★84-721-023-010	BUTTON,POWER		1
	1-14	★84-790-209-019	ROD,POWER	*	1
	1-15	★82-385-383-010	STOPPER,ROD		1
	1-16	★83-317-212-019	HOLDER,VS(H)		1
	1-17	★84-790-218-010	PLATE,SHIELD	*	2
	1-18	★84-424-008-019	KNOB,VOLUME		2
	1-19	★84-790-043-019	CABINET,STEEL 4	*	1
	1-20	★87-085-184-010	AC CORD BUSHING(H)		1
	1-20	★87-085-189-010	AC CORD BUSHING(U)		1
	1-20	★87-085-185-010	AC CORD BUSHING(E,K,Z)		1
	1-21	★87-034-749-019	AC CORD(H)		1
	1-21	★87-034-584-019	AC CORD(U)		1
	1-21	★82-187-797-019	AC CORD(E,Z)		1
	1-21	★82-187-796-019	AC CORD(K)		1
	1-22	★84-790-006-019	PANEL,REAR(H)	*	1
	1-22	★84-790-012-019	PANEL,REAR(HJ)	*	1
	1-22	★84-790-007-019	PANEL,REAR(U)	*	1
	1-22	★84-790-009-019	PANEL,REAR(E)	*	1
	1-22	★84-790-010-019	PANEL,REAR(K)	*	1
	1-22	★84-790-011-019	PANEL,REAR(Z)	*	1
	1-23	★84-790-216-019	SHAFT,VOLUME	*	2
	1-24	★84-790-015-019	KNOB,VOLUME	*	1
	1-25	★84-790-040-010	KNOB,BALANCE	*	1
	1-26	---	CHASSIS,9D		1
	1-27	★81-675-010-010	FOOT,H10		2
	1-28	★84-738-022-010	FOOT		2
	1-29	★84-731-027-010	FELT,FOOT		2
	1-30	★84-790-212-019	E-SPRING,ROD	*	2
	1-31	★84-790-206-019	ROD,EJECT	*	2
	1-32	★84-790-014-019	BUTTON,EJECT	*	2
	1-33	★84-790-039-019	KNOB,SLIDE N	*	3
	1-34	★84-790-038-019	KNOB,SLIDE N	*	1
	1-35	★84-790-213-010	PLATE,HEAT SINK	*	1
	1-36	★84-117-637-010	PLATE,SHIELD PT		1
	1-37	★82-231-213-010	SHEET 45X30(K)		1

EXPLODED VIEW – 2

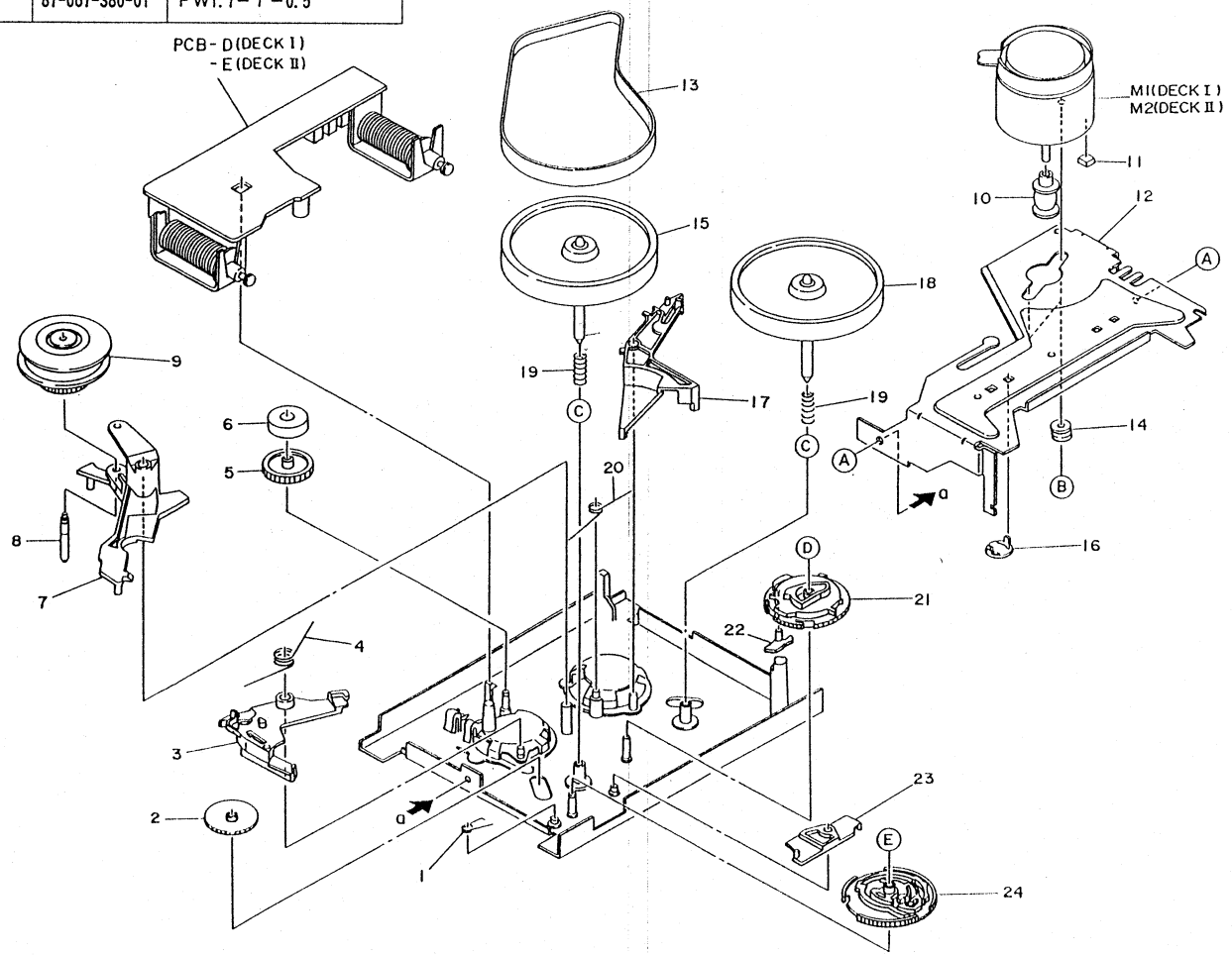
REF. NO.	PART NO.	DESCRIPTION
A	87-067-470-01	PW4.1–6.9–0.13
B	86-524-418-01	VFT2+1.4–5
C	87-067-177-01	V+1.6–5.5
D	87-081-489-01	PW1.7–3.5–0.25
E	87-067-174-01	VTT+2–4



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	2-1	★86-575-217-110	MECHANIZUM CHASSIS ASSY		1
	2-2	★86-535-239-110	LEVER, PLAY R		1
	2-3	★86-535-283-019	T-SPRING, PLAY GEAR R		1
	2-4	★86-535-371-019	T-SPRING, BRAKE R		1
	2-5	★86-575-225-010	T-SPRING, CASSETTE		1
	2-6	★86-535-252-210	LEVER, BRAKE R		1
	2-7	★86-535-370-019	T-SPRING, BRAKE F		1
	2-8	★86-535-247-210	LEVER, REC GUARD A		1
	2-9	★86-535-250-010	LEVER, METAL		1
	2-10	★86-535-249-210	LEVER, CASSETTE SENSOR		1
	2-11	★86-535-254-110	LEVER, CR		1
	2-12	★86-535-248-310	LEVER, REC GUARD B		1
	2-13	★86-535-251-010	LEVER, BRAKE F		1
	2-14	★86-535-240-210	REEL TABLE R ASSY		2
	2-15	★86-535-293-019	C-SPRING, REEL TABLE		2
	2-16	★86-524-218-119	STOPPER, REEL TABLE S		1
	2-17	★86-535-215-310	SLIDE PLATE ASSY		1
	2-18	★86-575-227-010	E-SPRING, LEVER SLIDE		1
	2-19	★86-575-226-010	E-SPRING, CHASSIS HEAD		1
	2-20	★86-575-236-010	S-SCREW, TAPE ADJUSTMENT		2
	2-21	★86-575-209-010	HEAD CHASSIS ASSY		1
	2-22	★86-575-207-010	HEAD HOUSING ASSY		1
	2-23	★86-535-289-010	P-SPRING, HEAD CHASSIS		1
	2-24	★86-575-214-110	GUIDE, TAPE		1
	2-25	★86-575-235-010	S-SCREW, AZIMUTH		2
	2-26	★86-524-300-019	P-SPRING, AZIMUTH		1
	2-27	★87-073-018-019	STEEL BALL 1.588		1
	2-28	★86-575-240-010	T-SPRING, GUIDE		1
	2-29	★86-535-246-210	GEAR, SEGMENT		1
	2-30	★86-575-206-010	GEAR, HEAD FR		1
	2-31	★86-535-290-010	T-SPRING, GEAR SEGMENT		1
	2-32	★86-535-284-010	E-SPRING, LEVER DIRECTION		1
	2-33	★86-535-218-210	LEVER DIRECTION ASSY		1
	2-34	★86-524-233-119	STOPPER, REEL TABLE T		1
	2-35	★86-535-282-019	T-SPRING, PLAY GEAR F		1
	2-36	★86-535-238-210	LEVER, PLAY F		1
	2-37	86-535-226-110	PINCH LEVER F ASSY		1
	2-38	★86-575-222-010	T-SPRING, PINCH F		1
	2-39	★86-535-287-110	E-SPRING, PINCH		1
	2-40	★86-575-223-010	T-SPRING, PINCH R		1
	2-41	86-535-228-110	PINCH LEVER R ASSY		1
	2-42	★86-575-234-010	HOLDER, WIRE		1
	2-43	★86-535-353-010	FELT SQ 5-4-2		1
	2-44	★86-517-353-019	SEET, QUICK		1

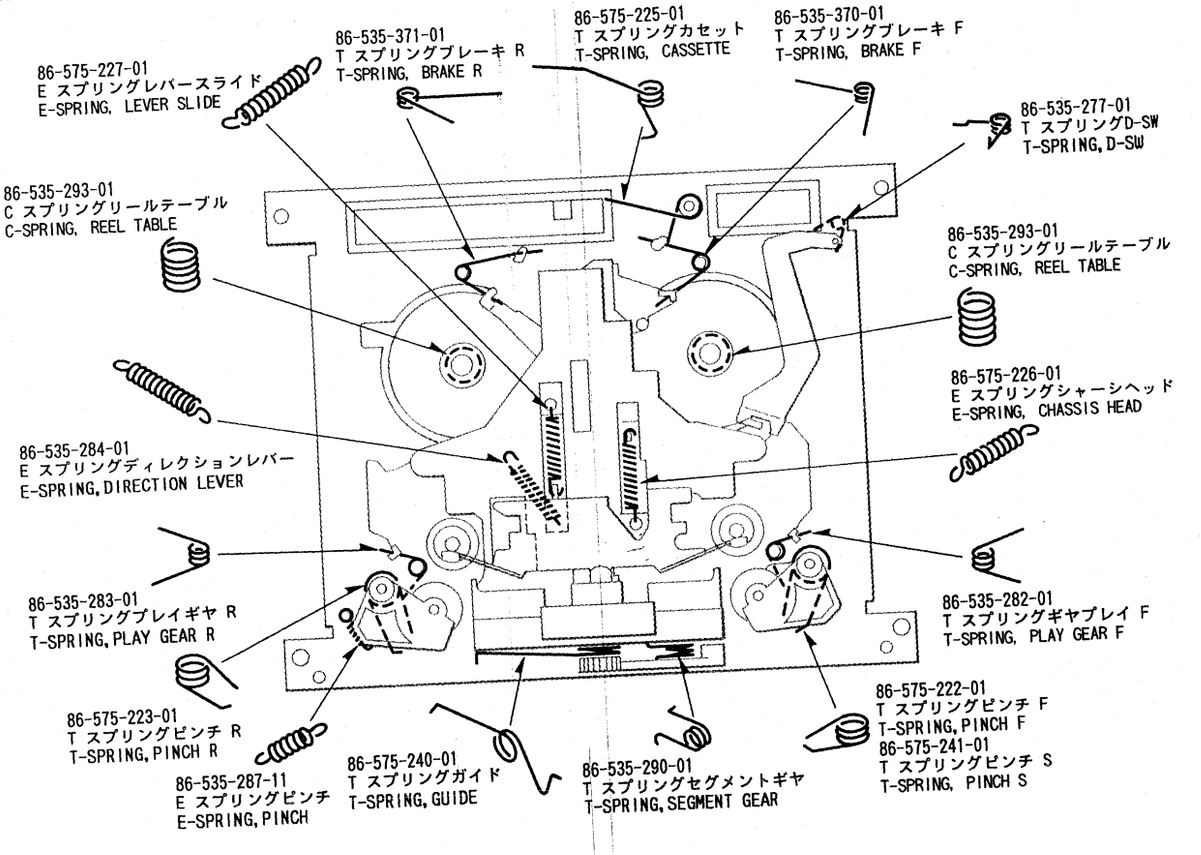
EXPLODED VIEW – 3

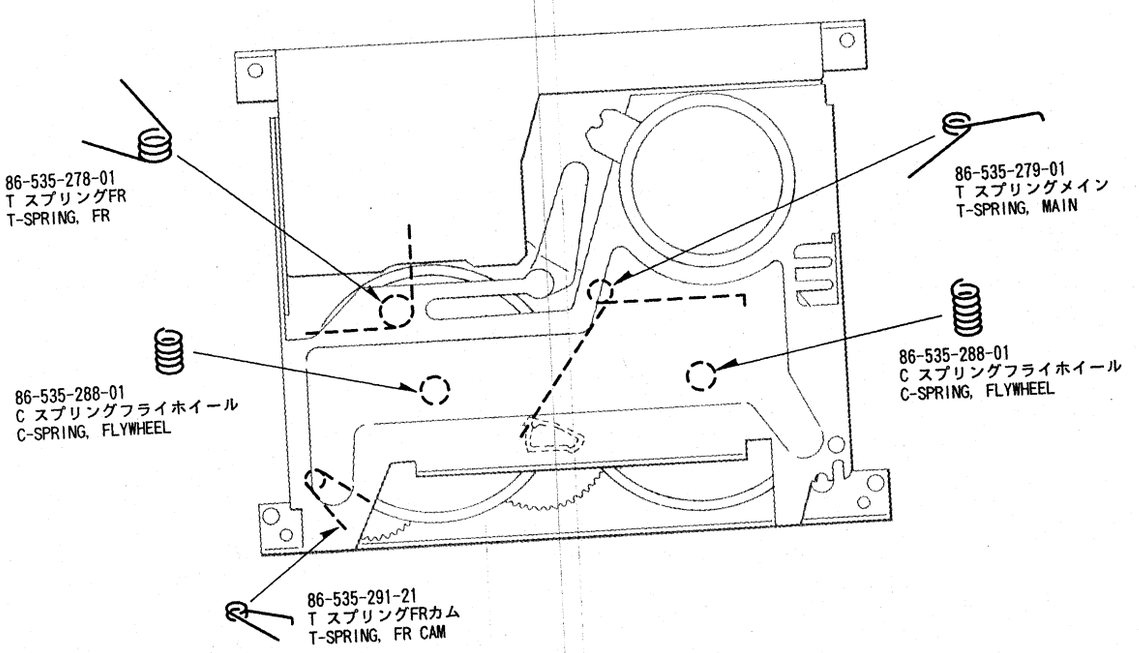
REF. NO.	PART NO.	DESCRIPTION
A	87-081-501-01	VTT+2.6–4
B	86-575-243-01	MOTOR SCREW
C	87-067-332-01	PW2.8–4.7–0.13
D	87-081-489-01	PW1.7–3.5–0.25
E	87-067-380-01	PW1.7–7–0.5



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	3-1	★86-535-291-210	T-SPRING, FR CAM		1
	3-2	★86-535-259-310	GEAR, PLAY		1
	3-3	86-535-230-310	LEVER, TRIGGER FR		1
	3-4	★86-535-278-019	T-SPRING, FR		1
	3-5	★86-575-220-010	GEAR, IDLER		1
	3-6	★86-535-614-010	RING, MAGNET		1
	3-7	86-535-233-110	LEVER, FR		1
	3-8	86-575-213-010	SHAFT, FR		1
	3-9	★86-535-301-110	SLIP DISK ASSY		1
	3-10	★86-575-237-010	PULLY, MOTOR B		1
	3-11	★86-575-261-019	G CUSHION 5-5-1.35		1
	3-12	★86-575-218-010	HOLDER, MOTOR		1
	3-13	★86-575-210-110	BELT 1		1
	3-14	★86-575-242-010	G CUSHION DIAL3.9-3.2		2
	3-15	86-575-203-010	FLYWHEEL F ASSY		1
	3-16	★86-535-255-010	RETAINER, FLYWHEEL		1
	3-17	86-535-231-210	LEVER, TRIGGER PLAY		1
	3-18	86-575-201-010	FLYWHEEL R ASSY		1
	3-19	★86-535-288-019	C-SPRING, FLYWHEEL		2
	3-20	★86-535-279-010	T-SPRING, MAIN		1
	3-21	★86-535-260-310	CAM, MAIN		1
	3-22	★86-535-308-110	LEVER, CHANGE		1
	3-23	★86-575-229-010	LEVER, PAUSE B		1
	3-24	★86-535-261-310	CAM, FRP		1

SPRING APPLICATION POSITION





■ ACCESSORIES/PACKAGE LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
				*	1
	1	★84-789-904-019	INSTRUCTION BOOKLET EX		1
	2	★87-032-845-019	PLUG SIEMENS(H)		2
	3	★87-034-773-010	CORD PIN,R-237-W-1M		1
	4	★86-432-004-019	RC-W100		